Watershed Assessment for
The Reedy Creek Watershed

Hydrological Unit 05030203140

Roane and Wirt Counties

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Prepared By:

USDA Natural Resource Conservation Service
WV Soil Conservation Agency
Little Kanawha Soil Conservation District

Contact:

Delmas Carr
USDA NRCS
RT 5 Box 1000
Parkersburg, WV 26101
(304) 422-9072

Sam Sheets
USDA NRCS
677 Ripley Rd Suite 2
Spencer, WV 25276
(304) 927-1022

Reedy Creek of Little Kanawha River
Roane and Wirt Counties, WV
Hydrologic Unit No. 05030203140

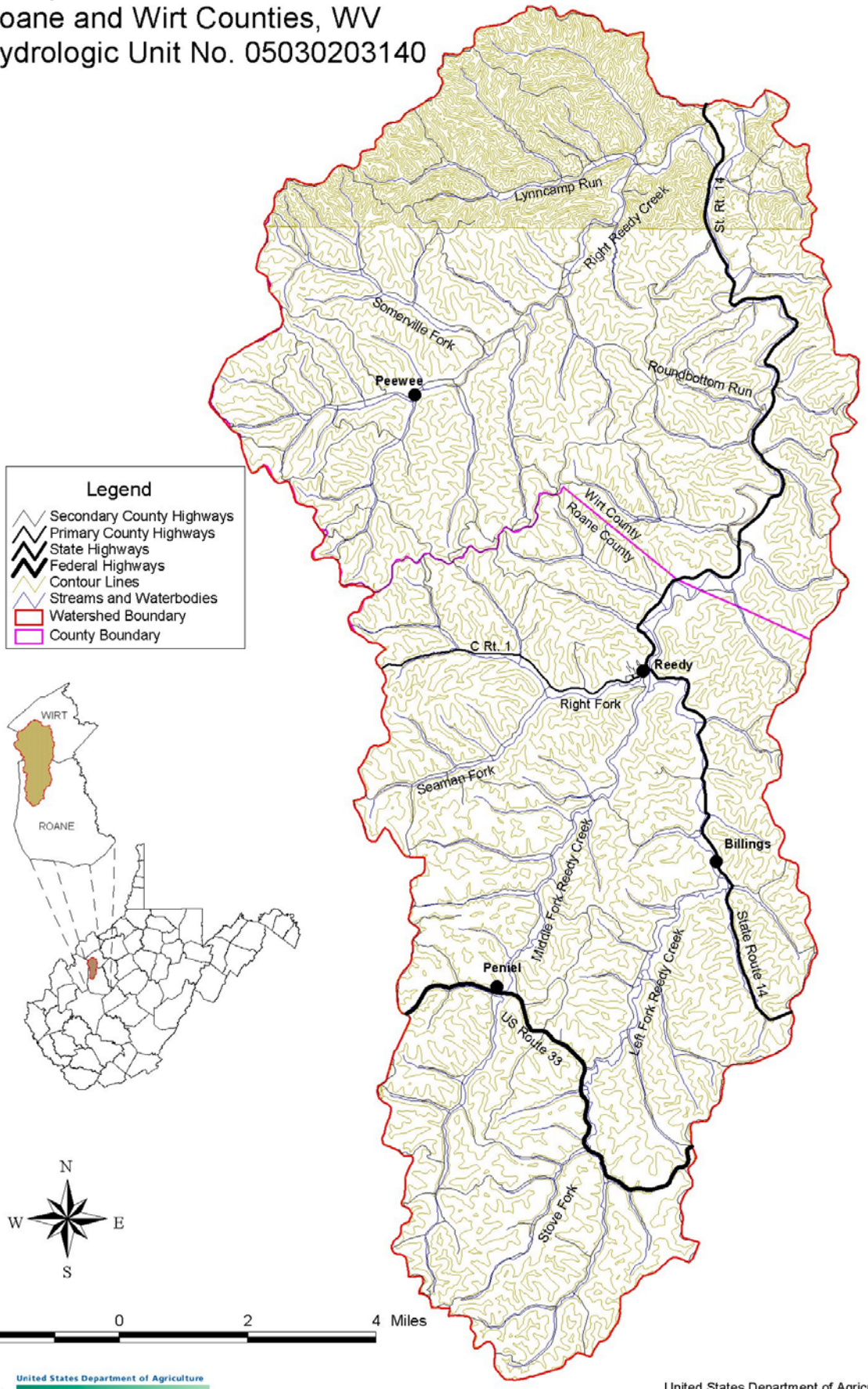

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Table of Contents

Introduction

The Reedy Creek Watershed is located in the southern region of Wirt County beginning at Courtney ridge and the northern region of Roane County ending just south of Vandalia. The Reedy Creek Watershed encompasses approximately 41,400 acres in Wirt County and 42,700 acres in Roane County, totaling 84,100 acres. Reedy Creek and its main tributaries (Right Reedy, Right Fork, Left Fork, and Middle Fork of Reedy Creek) are 56.4 miles in length. Reedy Creek joins the Little Kanawha River at Palestine, which empties into the Ohio River at Parkersburg. Some of the communities in this watershed include Reedy, Peniel, and Billings.

The average temperature of the Reedy Creek Watershed is similar to the rest of West Virginia. In the winter the average high temperature ranges from 42- 46 degrees Fahrenheit, and in the summer the high averages between 80 and 90 degrees Fahrenheit. The average rainfall for the watershed is 38 inches, and of that 56 percent falls between April and September. The average relative humidity in the mid-afternoon is between 50 to 60 percent.

The terrain of the Reedy Creek Watershed consists of ridges and steep hillsides with a few narrow benches. Terraces are found along larger streams. Elevations in this watershed range from 1,211 feet near Mount Union Church in Roane County to 675 feet at Palestine in Wirt County. The major soils are described as difficult to work with on steep slopes and easy to work with on low lying floodplains. The major land use is forestland, which consists of 78 percent, with the rest mainly in pasture and hay land, 21 percent.

The primary resource concerns within this watershed are **pastureland erosion and water quality pollution from animal waste, winter feeding areas, and urban sewage systems in Reedy**. Other associated concerns within the Reedy Creek Watershed are fishing impairment, loss of recreational value due to sediment, and deterioration of livestock water quality.

This document represents a cursory assessment the watershed level that will highlight problems and opportunities for further work. The study, by design, is short and concise in scope. It will serve as a foundation document that can be used (and supplemented as necessary) to seek funds of all types from federal, state, local, or private sources.

Social Characteristics

Population and economic characteristics for the Reedy Creek Watershed are derived from the 1990 Census, the 2000 Census, the 1996 West Virginia Blue Book, the June 2001 West Virginia Economic Summary, the 1995-96 West Virginia Statistical Abstract and other reference materials. For the most part, statistics are only available on a county or incorporated town basis. For the purpose of this assessment, statistics at this geographic level are adequate to describe conditions in this watershed.

Population

The watershed of Reedy Creek encompasses the small communities of Vandalia, Morning Star, Clarence, Reedyville, Peniel, Reedy, Mt. Olive, Billings, Seaman, Rock Valley, Peewee, Lucille, Two Run, Zackville, Rover, and Palestine. The area is rural, with Reedy being the only incorporated town. In the 1990 Census, Reedy had a population of 271 persons, which was a decline of nearly 20 percent from the 1980 Census. Reedy Creek Watershed flows over two counties, so population trends in both Roane and Wirt Counties gives a perspective for the watershed. Both counties had growth in population as indicated by the Year 2000 Census. Roane increased by 2 percent and Wirt grew by 13 percent. For the same time period (1990-2000) West Virginia averaged an increase of less than one percent. Despite the increase in population, Reedy Creek watershed is still very rural and sparsely populated.

Employment

Employment information is available at the county level, which describes an area larger than the Reedy Creek Watershed, but will be descriptive for the watershed. Unemployment for Roane County for April 2001 was 17.3 percent compared to 5.2 percent statewide and 4.2 percent nationally. Wirt County unemployment rate for the April 2001 time period was 10.6 percent. Both counties are significantly above the state and nation unemployment averages.
Over half of the work force in Wirt County travels to another county for employment and about 30 percent of Roane County workers travel out of the county for work.

Income

Household income in Roane County is below the state average coming in at $23,846 versus $27,432 for the state. Wirt County is also below the state average household income at $26,155. Both the county and state are below the national household income of $37,005. Both counties have a higher percentage of persons in poverty than the state average of 16.8% and the national average of 13.3%. (Yost 2001)

Land Use and Soils

Land use in the Reedy Creek Watershed was calculated from USGS 7.5 minute quadrangle maps, aerial photography, farm plans, and field office personal knowledge. The major land use in this watershed is forestland, comprising 78.5 percent of the watershed. Pastureland and hayland comprise 21.2 percent of the watershed. Cropland makes up a very small percentage of this watershed, 0.1 percent. The main type of agriculture activity is animal husbandry. Beef cattle are the main animals utilizing pasture and hayland grasses. There are sheep and dairy cattle in this watershed, but do not comprise of a significant percentage.

The following table summarizes land type, given in acres and percent of the total watershed.

Land Use	**Acres**	**Percent**
Cropland	45	0.1
Pastureland	13,230	15.7
Hayland	4,630	5.5
Forestland	65,985	78.5
Urban	80	< 0.1
Other	130	0.1
Total	**84,100**	**100**

The dominant soils in the Reedy Creek Watershed are the Upshur, Gilpin, Peabody and Tilsit soils on uplands, the Vandalia soils on foot slopes, the Monongahela soils on high stream terraces and Senecaville, Sensabaugh, Moshannon, Hackers and occasionally Melvin soils on floodplains.

The Gilpin and Upshur soils are usually mapped together as a complex and as a single map unit on ridges and flats. The upland ridges have a combination of Upshur, and Gilpin soils on slopes mostly ranging from 3 to 35 and Tilsit soils on slopes of 3 to 8 percent. The side slopes are mostly Gilpin-Upshur complex soils or Gilpin-Peabody complex soils on the very steep slopes. The Upshur soils are deep, well drained, and clayey soils that have developed from limy red and olive colored shale and mudstone. The Peabody soils are moderately deep, well drained, and clayey soils that have developed from limy red and olive colored shale and mudstone. The Gilpin soils are moderately deep, well drained and silty soils that have developed from interbedded siltstone and sandstone. The Tilsit soils are moderately well drained, deep and silty soils that have developed from interbedded shale and siltstone. The Upshur soils have a moderately high to high level of natural fertility and are good for grasslands but in past generations were cropped and experienced severe and very severe erosion. In Wirt County the Gilpin like soils are call Muskingum and are similar to the Gilpin soils mapped in the same complexes with the Upshur soil.

The Vandalia soils are deep to very deep, well drained and clayey soils that have developed in colluvium from the uplands on slopes mostly ranging from 8 to 35 percent. The Monongahela soils are deep, moderately well drained and loamy soils that have developed in old alluvial sediments on slopes mostly ranging from 3 to 20 percent. The Vandalia soils have a medium to high natural fertility and are used mostly for pasture and woodland with some areas in hay. The Monongahela soils have a low to medium natural fertility and are used mostly for hay, and pasture and in some areas are cropped or in woodland.

The Moshannon soils dominate the floodplain soils along Reedy Creek and are very deep, well drained and silty soils that have developed in recent alluvium on low floodplains. The Sensabaugh soils are gravelly, very deep, and well drained soils that have developed in recent alluvium along small drainageways and tributaries of Reedy Creek. The Senecaville soils are very deep, moderately well drained, and silty soils that have developed in recent alluvium on low and high bottom floodplains. The Melvin soils are deep, poorly drained and silty soils that have developed in recent alluvium on low and high floodplains and only a limited acreage exists in the watershed. The Hackers soils are well drained, very deep, silty and have a rare flood hazard and have developed in recent to moderately old alluvium on high bottom floodplains. These floodplain soils have high fertility levels and are mainly used for cultivated crops, hay or pasture. These floodplain soils are located along streams and are subject to a wide range of flooding frequencies.

Urban

Reedy is the only community in the Reedy Creek Watershed that has resource concerns associated with urban landuse. The following addresses stormwater management, sediment and erosion, and water and wastewater. (USDA- NRCS 2001)

1. Stormwater Management: Stormwater management in the Reedy Creek Watershed is insignificant.

2. Sediment and Erosion: The level of intensity of development in areas of the watershed is very little.

3. Water and Wastewater: In some areas sewage in the stream is a problem. Many private individual septic systems do not work properly or have straight pipes to the creek. The town of Reedy has the only sewage treatment plant in the watershed. Wastewater from the treatment plant could pose a potential environmental concern.

Mining and/or Oil and Gas Extraction

There are no known active or abandoned, surface or subsurface coal mines in this watershed. Several oil and gas wells exist in the Reedy Creek Watershed, but do not pose an environmental problem. (USDA- NRCS 2001)

Forest

Forestland is the main land use in the Reedy Creek Watershed (78.5 percent, 65,985 Ac.). According to the Forest Statistics for West Virginia, which gives information for each county in West Virginia, individuals own the majority of the forestland (79 percent). The forest industry and farmers account for the rest (15 and 5 percent respectively). A significant landowner in Wirt County is Westvaco. They own one- third of the land in this county.

The dominant forest stand type is oak/ hickory, which accounts for 85 percent. Other growing- stock trees include Yellow Poplar, Red Maple, Beech, and Virginia Pine. Of the stand- size class in this watershed, 82 percent is sawtimber. Poletimber accounts for 12 percent and sapling and seedling accounts for the rest. Approximately 69 percent of the forestland is in the fair and poor site productivity class. Nearly two- thirds of the watershed is either moderately or fully stocked (74 percent). (DiGiovanni 1990)

In the past four years, 1997-2000, approximately 4,500 acres has been harvested in the Reedy Creek watershed. Less than 1 percent of harvests have been planned and overseen by a professional forester. Less than 10 percent of woodland owners are following a professionally prepared forest management plan.

For the past 5 years, loggers have been good about following Best Management Practices (BMP's). Access and forest harvest roads and trails are not a significant source of erosion and sedimentation. (Menton 2001)

Within the counties of the watershed there are a few markets available for woodland owners. There is one dry lumber and 5 green lumberyards in Roane County and one green lumberyard in Wirt County. In Roane county there is also a rustic producer company, one treatment plant and one veneer plant. There are also three consumer product companies in Roane County. The products manufactured are trusses, cabinets, and pallets. (West Virginia Division of Forestry 2001)

The majority of the fires that have occurred in the Reedy Creek Watershed in the past five years have been small in size, mainly 1 acre or less. Neglected brush and trash fires were the main causes of the fires in the watershed. Cost of suppression varies with each fire.

Damage caused by pests to woodlands in the watershed is mainly due to destructive grazing by deer. Most of the damage is located along the edges of woodlands. (Menton 2001)

Agricultural

According to the Agricultural Census data, there are approximately 437 farms in the Reedy Creek Watershed. The average size of the farms in this watershed is 150 acres. The majority of the farms are grassland beef cattle farms, comprising of about 70 percent of the farms.
Most of the farm operators are part- time operators. Nearly 60 percent of the operators' s principle occupation is off the farm, and about 41 percent of the operators in this watershed work 200 or more days off the farm. Approximately 80 percent of the farms sell less than $10,000 of agriculture products per year.

Grassland

Approximately 13, 230 acres (15.7 percent) of the land in the watersheds is managed for pasture and 4,630 acres (5.4 percent) for hayland, some of which is grazed during fall months. The grassland areas within the Reedy Creek Watershed have excessive soil erosion due to the overgrazing of pasturelands, soil types, and steep slopes. Bluegrass, white clover, tall fescue, and orchardgrass are the predominant grass/legume species on pastures.

The application of lime and fertilizer is essential to pastureland in order to establish a good productive pasture. The normal pH on pastureland is usually less than 6.0. Approximately 70- 75 percent of the farmers within this watershed practice continuous grazing management system. Brush control is a problem due to Multifloral Rose. Most farmers do not take regular soil tests or apply nutrients on a regularly scheduled basis.

Forage quality on pastures during the grazing season is adequate for cow/ calf and stocker cattle operations. Higher quality pastures exist where landusers have implemented lime and fertilizer programs. Lower quality pasture does exist on a few farms where fescue and orchardgrass are allowed to over- mature and become less nutritious.

Many farmers experience problems with increased sediment and nutrient loads in streams due to winter feeding locations and lack of improved animal watering facilities. (UDSA-NRCS 2001)

Crop

Cropland comprises a small percentage of the total land use in the watershed (0.1 percent). The majority of the cropland is used to grow corn for grain. A few farms do produce tobacco, usually less than an acre in size.

The majority of the cropland is located in the floodplains along Reedy Creek and its tributaries. Most of the land has a 0 to 3 percent slope and is planted as a continuous crop. (USDA- NRCS 2001)

Agriculture Waste

There are a number of winter feedlots along Reedy Creek within 200 feet of the perennial streams that were identified as a high potential for contamination of surface or ground water with organic matter, bacteria, and pesticides. A survey of these areas was collected by driving through the watershed. At least 15 winter feeding areas were identified as potential sites for contamination. Since the bottomlands are mainly used for hay, with hay storage near by, most of the feeding areas are located near farmsteads or in bottomlands in or adjacent to the floodplain. This can cause a potential problem whereby streams are polluted with animal waste due to the concentration of animals near steams and runoff.

Another source of agricultural waste in this watershed is from cropland. A total of 19 tobacco fields were identified in the survey. The fields ranged from 0.5 acre to 1.5 acres. The table shows the width of the buffers between the stream and crop fields found in the watershed.

	75 ft. Buffer	**50 ft. Buffer**	**30-40 ft. Buffer**	**15 ft. Buffer**
No. of Fields	7	5	2	5

Also identified were 2 corn fields 5-8 acres in size with no buffer along the streambank. Cropland with little or no buffer increases the level nutrient runoff and pesticides in the stream. (USDA- NRCS 2001)

Environmental and Cultural Resources

Fish and Wildlife

Forestland encompasses nearly 80 percent of the Reedy Creek Watershed. Several hay and pasture fields have not been managed and left abandoned. These fields provide good cover and nesting places for a wide variety of wildlife, such as rabbits, squirrels, and songbirds. Adequate food is provided by the presence of oak and hickory trees, along with a wide variety of wild herbaceous plants, such as pokeweed, sedges, asters, thistles, nightshades, and milkweeds. White- tailed deer are common throughout the watershed. They commonly graze in the hayfields near wooded areas, and they also browse on the brushy hardwoods that grow in some areas that were once used for hay and pasture. Turkeys are also present in this watershed. Turkeys are found in extensive woodland areas, and are commonly seen feeding in woodland clearings and hayfields with woodlands adjacent to them. Woodchuck and raccoon are also common in this watershed. (USDA- SCS 1970)

For general indication of population status of big and small game, harvest data listed in the Big Game Bulletin published by the Wildlife Resources Section of the Division of Natural Resources was used. The deer harvest in 2000 for the state of West Virginia shows a 16 percent decline from the 1999 season and 18 percent decline than the record

in 1997. In the past five years, 1996- 2000, an average of 5859 white- tailed deer are harvested on a yearly bases for Roane County, and 4469 in Wirt County. Spring harvest for wild turkeys average 319 for Roane County a year, and 276 for Wirt County. Very few turkeys are harvested in fall season, 22 per year for Wirt County. (West Virginia Department of Natural Resources Wildlife Resources Station 2001)

Reedy Creek's game fish include spotted, largemouth, and smallmouth bass, longear, and pumpkinseed sunfish and rock bass. Muskellunge are also found in the creek. Although game fish are present, the most numerous species include suckers and minnows. Due to damaging effects of suspended sedimentation seen in Reedy Creek year around and bottom siltation, primary productivity has decreased along with fish growth. This reduces the recreation value of the stream. Fishing for largemouth bass and bluegill is provided in farm ponds throughout the watershed. (UDSA- SCS 1991) None of the streams in this watershed are stocked with trout. (West Virginia Divison of Natural Resources 2001)

Threatened and Endangered Species

According to the United States Fish and Wildlife Service, there are no federally listed threatened or endangered species in the Reedy Creek Watershed. Although potential summer habitat does occur for the endangered Indiana bat, M*yotis sodalis,* it has never been documented to exist in this watershed. (Towner 2000)

Wetlands

The National Wetlands Inventory (NWI) has identified 7 wetlands in the Reedy Creek Watershed. All are palustrine, six are classified as open water intermittently exposed, and one is classified as emergent intermittently exposed. Most of the wetlands are 1 acre or less in size.

Also, by taking information off aerial photographs, an estimated 100 more wetlands were identified. All of these are open water/ unknown bottom, intermittently exposed, of which are small farm ponds and a few recreation ponds.

Wirt County and Roane County soil surveys identified 8 wet spots in this watershed. These are areas with hydric soil or hydric inclusions in the soil, commonly wet meadows.

Riparian Areas

Riparian areas provide food, water, and cover for wildlife and domesticated animals. Riparian vegetation can remove excess nutrients and sediment from surface runoff and shallow groundwater. The vegetation shades streams to optimize light and temperature conditions for aquatic plants, fish, and other animals (NRCS/RCA Issue Brief 11, 13 1996,1997)

Along Reedy Creek, the riparian zone is 75 percent meadow on both sides of the creek and 25 percent with meadow on one side and a single line of trees on the other. There are

a few small areas with woodland on one side, particularly in places with extremely steep hillsides. The tree species observed along the stream were Box Elder, Sycamore, and Willow. These trees aid some in bank stabilization, but do not significantly aid wildlife in the form of cover. The canopy closure over the water is zero for areas with meadow on both sides and an estimate of 10 percent on parts of the steam with a single line of trees.

The riparian zone on Middle Fork, one of the main tributaries of Reedy Creek, has meadow on both sides of the stream with an insignificant amount of trees. This type of riparian zone has no functional or wildlife value since the land is hayed up to the edge of the stream bank. The canopy closure is zero.

Left Fork and Right Fork of Reedy Creek has a riparian zone that consists of meadow on both sides of the stream with a single row of trees along the banks. The tree species are similar to that on Reedy Creek. The trees aid some in bank stabilization. Canopy closure over the stream is estimated at 30 percent.

Right Reedy has meadow on both sides of the stream and a single line of trees on one or both sides of the stream. Tree species are similar to that of Reedy Creek and serve the same function. There were two 0.5 acre tobacco fields identified with having a buffer of less than 30 feet from the streambank on this tributary. The canopy closure is estimated at 10 percent.

Beyond these major tributaries listed above, the smaller tributaries have riparian zones with 75 percent of the land in meadow on one side and woodland on the other side. The smaller the tributaries are in the watershed, the more woodland borders the streams, so that in some places meadow consists of 25 percent of the border with woodland on the other side. The rest of the riparian zone is wooded on both sides. The wildlife value both in food and cover increases with the increase of woodland. (USDA- NRCS 2001)

Water Quality

Surface

Reedy Creek is not listed on the 1998 West Virginia 303(d) list of quality limited waters. Consequently, Reedy Creek meets state water quality standards due to any pollution impairments. (Department of Environmental Protection 2001)

According to EPA data, aluminum and iron are a parameter of concern in the Reedy Creek Watershed. The priority for Total Maximum Daily Load (TDML) is low. TDML measures the amount of pollution a stream or river can receive and still meet water quality standards. The source of the pollution according to this report is unknown. (EnviroFacts 2001)

Groundwater

The water source for the majority of the households in the Reedy Creek Watershed is supplied by individual wells. There are approximately 1,867 wells in the watershed, 1,236 in Wirt County and 631 in Roane County. Within the past few years, public water has been extended in small areas in the watershed, closest to Spencer. (Peter 2001)

Cultural Resources

The American Indians had some major camp areas in the Little Kanawha River Valley. Reedy Creek empties into the Little Kanawha River at Palestine and at least 8 known prehistoric or historic sites are recorded in this watershed.

More prehistoric and historic sites are present in this Reedy Creek Watershed but have yet to be discovered or recorded with the West Virginia State Historic Preservation Office. Any future development would require an assessment to determine potential impacts to any cultural resources that maybe present whether they are known or unknown. (Shutts 2001)

Floodplain Assessment

According to the West Virginia Statewide Flood Damage Assessment and Mitigation Plan, published in 1992, 2,531 acres occur in the Reedy Creek 100-year floodplain. Within the floodplain there are 68 residential homes and 17 commercial buildings. Most of the land use in the flood plain is hayland, 73 percent. The average annual flood damages was estimated at $69,400.

Streambank Erosion

The table below represents land use along the streambanks of Reedy Creek and its tributaries.

% Urban	% Forested	% Pastured/ Hayed	% Cropped	% Fenced
1	60	40	1	1

Streambank erosion and sedimentation of Reedy Creek and its tributaries are of concern as a source of pollution to the watershed. Severely eroding streambanks are defined as streambanks mostly void of vegetation and having slopes steeper that 2 to 1. Most of the streambanks in the Reedy Creek Watershed have slopes that are 1 to1. This causes the banks to undermine themselves and topple into the stream. This watershed is listed among the first 20 of 60 watersheds for severity of sediment pollution from streambanks in the West Virginia Agricultural Water Quality Management Plan. According to this publication, 180,000 feet of streambank in the Reedy Creek Watershed is severely eroding. This report estimated that 108,000 feet of stream needed vegetative protection and 72,000 needed mechanical protection. Although this publication was published in

1979, very little work on streambanks has been done since its publication, and the numbers are fairly accurate.

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